*Draft Notes*
*Dr. Laura Nelson*
*Utah Energy Forum 5-23-07*

**Dr. Laura Nelson, Energy Advisor**

- Utah Energy Forum has grown tremendously. It started as the Wasatch Energy Breakfast, arranged by Pacificorp. They approached Laura and asked if she would be willing to take over these meetings. She did, and they became the Utah Energy Forum.
- This will be Dr. Laura Nelson's last forum. She is leaving to spend some more time with her family. Dr. Dianne Nielson will be the new Energy Advisor to Governor Huntsman. She is unable to make this meeting, as she is at meeting to discuss the first national climate change registry. Industry has repeated several times that they need some consistency in the reporting requirements on greenhouse gas emissions.
- Earlier this week, Governor Huntsman signed an MOU that included 5 others states and British Columbia and was about reducing green house gases. We view this as a positive move, a full partnership with other western states (OR, WA, NM, AZ, CA). We are predominately an exporting state and decisions made by these states affect us. This MOU will have some challenges, but the Governor clearly stated on Monday that coal will continue to be a part of our future. We will work together with importing states and look at the full set of opportunities that will be vital for our energy and economic future. It is more critical than ever that we continue to work together in these collaborative meetings.
- The Chairman of the Public Service Commission, Ted Boyer, has graciously sponsored this meeting and we thank them for their generosity. Also thank you to Questar for providing the meeting location for us. Thank you to our Legislators who meet regularly with us to provide updates. Thank you to this group, the UEF participants, who give their input and ideas to help us implement policy. Thank you to our presenters who take time out of their schedule to educate and inform about various energy topics.

**Legislative Update**

**Representative Barrus**

- We appreciate the opportunity to be here. This is a great forum to meet together and discuss energy issues. Last year we focused on conservation and energy efficiency. We passed legislation that included energy efficiency for state fleets, and incentives for school districts.
- This year, from a personal standpoint, I am trying to focus my efforts on development. My plan covers a few areas: conservation and efficiency, development of state energy resources, transmission and transportation of energy, and how we regulate energy in state. We are trying to find balance in state and development both traditional and non traditional resources. We need development for this nation to head down the road to energy independence and also for this state to use their resources wisely and to benefit from that economically. For oil shale and tar sands, we are looking at bringing electricity and natural gas to areas to be able development those resources. I have heard numbers of up to 74% equivalent in known oil reserves in the world in just this area. We have this rich energy deposit if we can find ways to get there, extract it, and to be environmentally conscious about it. If we can solve those issues, this could be good stability for our state

and country and economically stability for the Uintah Basin. The Royalties from the SITLA lands would reach millions if not billions in funds for education in our state.

- Another thing working with Senator Greg Bell on is legislation to mirror the Wyoming Infrastructure Authority. We are working on the first Utah Infrastructure Authority that has bonding ability and other authority. We are still in the first states of this, we ware getting expertise together.
- I am also trying to coordinate with our federal congressional representative about where we are going with the State energy policy. We want federal policy to match the direction of what is going on here in the state and avoid conflicts.
- When we first started the Energy group and I don't think we realize just how much was going on. That first year we passed an umbrella energy policy. Then we looked at the issues in the state and the items of recommendation: state buildings with energy efficiency passed, and this last year, several bills were covered as well. We will try to bring one about fuels for vehicles. I think this is one of the most exciting areas, so much to get done.

**Representative Becker**

- My focus this year is looking at more local government issues. We must adapt quickly or will be left in the dust. We can make sure we are not left in the dust, and instead lead the way at the forefront. The Governor's recent signing about climate change is reflective on how fast things can happen. I am on the Blue Ribbon Advisory Council on Climate Change (BRAC) and we are working on understanding the issues and how best to make recommendations. This recent announcement had not yet even been discussed. That shows how fast these things go. This means we must invest in our future with renewables and energy efficiency that reflect climate change and the changing environment in the nation. I am glad all of you are going to solve all of our problems.
- Thank you to Dr. Laura for the great job she has done. She has truly accomplished a lot.

**Questions and Answer**

- You said you are going to really look at oil shale, are you talking about technology or incentives?
    - Both. I would like to see us, as a state, provide an incentive, but we will also be looking at USTAR and will be working with them and see how the energy resources can be developed. Al Walker just went to USTAR.
- Is the Legislature doing anything on Carbon Sequestration?
    - Legislature is not studying this itself, but there are reports given to us and we are trying to learn more about it. From a personal perspective, I have a lot to learn and a lot of questions that needs to be answered. Businesses need to be comfortable that if we have legislature that requires it, that they will be protected from certain risks. It is still in its infancy. This has been a topic for BRAC on this and some incredible research been done in UT. This is an item for study list on Natural Resources and Public Utilities and Technology Interim Committees. We will look at what comes out of BRAC and the Energy Policy Working Group and it will be evaluated from State perspective. We will look at Congressman Matheson's energy policy work. There will be some Federal bills coming out of

the House of Representatives. That is something I hope to work on in DC when I go.

- USTAR: Brian McPherson is a member of our team and in one of the 7 national centers for Carbon Sequestration. We just received an 18 million dollar DOE grant and in line for another 65 Million dollar DOE grant. We have some interesting talent in Utah working on this and in the West.
    - We need to get you to the Legislature to report on that work.
- As we move forward on this global climate change issues, we should remember 94% of the state is powered by coal. We are one of the three highest in the nation. So any carbon tax or additional costs on coal production will have a bigger impact on this state. How are you going to handle this?
    - I agree and realize that. I wish there had been more dialogue with BRAC and such before the MOU was signed. We do have to recognize the impacts that that will have and we do.
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**Laura Nelson**

- It is very true: we can be either left in the dust or be prepared to respond. We do have a progressive mining operation industry in the state that are looking at carbon impacts and making voluntary reductions. We also have very proactive utilities and municipals that are voluntarily making more efficient operations and upgrading to make good use of our resources in a sustainable way. We do a lot more than we get credit for, through voluntary efforts. We also should emphasize that the Governor believes that BRAC is very critical to informing on decisions going forward as we look at recommendations and additional information on how we address carbon. A key function is development and a diverse set of resources. The Energy Advisory Council noted 3 ½ billion dollars in GSP came from natural gas, oil, and coal. We have a great amount of effect, with little impact on the environment.

**Ted Boyer, Public Service Commissioner**

- This is a great forum, bringing people together to discuss ideas from different perspectives: Communication.
- The way I see it, there is a four horned dilemma we are facing: increased demand for energy (population birth, immigration, bigger houses, more electronics); a cherished value of being entitled to low cost, low risk energy and are used to that and want to continue; the cultural shift we are seeing and the speed of change towards more concern for the environment, climate change, and emissions; and lastly, an acute need to become less dependent on international fuel. There is no one solution to satisfy these four objectives. We don't talk about the silver bullets anymore, but silver buckshots. The solution has to be multifaceted. During the Utah Energy Summit, the Governor spoke and said (to paraphrase) that the issues we are facing are enormous challenges, and require the same commitment as in the 1960s putting people on the moon. We need this at federal and state levels. If the fed government doesn't act, the states are going to have to step up to the bar. I think that states should be involved. The federal government does a one size fits all bill, and they are not familiar with our desires, circumstances, and

resources. It makes a great sense for the state to be involved in this and working towards a goal.

- Climate change: regardless of what you think of climate change, if the policy makers believe it is changing and human caused, they will pass laws in which we have to function. The way we go about our business will be affected in a fairly dramatic way. The science is very hard with all the variables and the correlations. Governor Huntsman signed the MOU: The Western Regional Greenhouse Gas Initiative. He is willing to spend political capital to show his concern for this issue.
- In 2004, the Energy Advisor position and the duties of the Energy Advisor were formed. In the 2005 Session, energy resource procurement act passed: new resources are procured by regulated utilities. Utah Code 54-17-302 states the Public Service Commission is to procure any new resources over 100 megawatts or anything over a10 year duration period. To determine whether the resource is acquired in compliance with this, we have a solicitation process. These resources have to be approved by the Commission and in the public interest. The Commissions must take into consideration: the result in acquisition, the delivery of electricity at the lowest possible costs, the long-term and short-term impacts, any risks, reliability, financial impacts on the utilities, and any other factors determined by the Commission to be relevant. We have an integrated resource planning process, but we must ask ourselves, does our integrated planning still work with good facts and a given point in time? We think it is a great process and can accommodate things like carbon capturing, but it really depends on the information that goes into this process at the beginning. The current energy landscape is changing. Rocky Mountain Power has an RFP for new base loading sources. This will come to us at some point. We will have to quantify the environmental risk, carbon taxes, cap and trade, costs of mercury, etc., health costs, changes in federal law, renewable portfolio standards, and a different legal landscape
- We make every effort to follow the law, and make appropriate resource decisions. Utah electrical generation capacity for 2007: Coal 58%, natural gas 40%, and renewables and other technology 2%. The only new generation that has come on since I have been in commission has been combined cycle and wind and geothermal.
- In times of changed, the learner inherits the earth, and the learned finds themselves well prepared to face a world which no longer exists.

**Rich Walje, President Rocky Mountain Power**

- Policy and the regulatory realm: our perspective of the changes coming. We have the porcupine wheels of dilemma, there are so many aspects to what is going on: customer and consumer utility view. The world is changing dramatically; however, the rules that regulate what utilities do have been around for a long time. The primary objective was low cost, with some risk investment. It has been that way for decades.
- Utilities have their own method of measuring the change in temperature using methodology of cooling degrees day, and in the last 10 years we have had some of the hardest days. We have what we think is going to happen in the regulatory arena. It is like bedrock into sand, but sand can reform back into bedrock, and we can have more certainty as the how our company should do business. We do business in nine states, six

as Pacificorp and three in Midwest. We are regulated differently in each state. We estimate that there are over a 100 people who audit or regulate our business. We will learn how to comply with any rule and regulation that comes out, but we would like a seat at the table as it is discussed what we will do moving forward.

- We need to ask when making policy if the goal of the policy is right? It is the fundamental of what trying to do with the policy. Do we have the right conceptual framework around the policy to get that done? Can you implement them, are they fair? Certain targets in other states, we really don't know how to meet with some of those constraints that we have today. How do people interact with it? Not just the people in the policy, but customers and consumers and the community at large. We have to see in detail what is going to happen. There was a policy in California that had effectively meant we had to store energy: something we couldn't do. The process was manipulated by other like Enron to gain millions for themselves, and others like us lost millions. The consumers ultimately paid the price. The 2000-01 deregulation debacle is an example of what can happen when implementation is not fully netted. Powerforward was implemented to save consumers during that time and was very forward thinking.
- Sometimes the expertise and information is not directly proportional to ability to affect policy. We know how to build and run pulverized systems; we know the costs and what it takes. We know what the impact of wind on our system, we have built one. We are bringing online over 1000 megawatts of wind power. We have built a geothermal plant. We know how to run one and the risks and costs of it. We are a participant in a nuclear power plant in West. We recently bid for nuclear sites. We entered into agreement with Wyoming to build an integrated gas combined cycle plant. We know how much it is to build and what the costs are going to be. We are one of the only groups who have actual market data on how much power plants are going to cost. We think carbon sequestration is going to happen, but it is not here yet. We do not have a carbon sequestration plant.
- We will have to figure out how to meet a renewable portfolio standard. We are regulated and understand that, and will do our best to comply. We have coal powered plants because people wanted us to build coal plants and we have, we will defend that. Those decisions were made 60 years ago and should not be viewed as an opportunity to demonize us. We comply with three things: engineering, regulatory, and financial. Let's look at this as any other problem we have solved, as change. If you are going to implement a renewable portfolio standard, we have to understand what is going to happen and how to implement. The details do matter.

**Alan Allred, President Questar**

- As a participant in the energy business in the West, we are connected. What happens in one place does affect another. As we look as these issues, climate change and greenhouse gases, it is important to really understand what it will affect. What looks good on paper does not always work well.
- Overview of natural gas: Supply and demand are carefully balanced in the US. We are consuming just about what we are able to produce. Prices fluctuate greatly with any minor changes in supply. In the Rockies, we have a very adequate supply. The national prices are $8, and this region is $4. We are producing more than we are able to transport

by pipelines. This may seem good, but people will stop drilling because of it and the prices will rise. We are working on finishing more pipelines. Even though prices may seem high, they are the lowest in the lower 48 states. The only place is cheaper is Alaska, which has a lot of natural gas and no way to transport over 40% of it. The natural gas consumed is directly owned by Questar and so it has a lower cost. Another important factor in Questar gas prices is efficiency. On the lowest operating costs per customer, we are 6 out of 70 companies. Efficiency helps us keep prices affordable. We are serving in a market that is growing by about 30,000 customers a year. 90% of those are residential customers. We thought that housing would slow down, but current market is still high. We are still one of the fastest growing markets in the country. That growth requires capital dollars to meet that increase in demand. We are reinforcing feeder lines that were put into place in the 1950s. It takes 100 million dollars a year in infrastructure costs to meet that growth. It will take time for that pipe to be replaced, but it has to happen for safety.

- This winter there was a tremendous shift in load to match the 40,000 to 80,000 decotherm change. We had those two very cold weeks. We were able to meet that demand, but only because we had been reinvesting in lines and feeders. Low cost service as the goal is often spouted, but customers don't really want the lowest costs, they want reliability. If we didn't make that peak demand day, we could have had lower costs, but people would be without heating. What customers want is adequate, reliable service at a reliable price. Last year was the coldest year on our gas meters in last 10 years.
- Energy Efficiency Program. We made quite an effort last year with the Thermwise programs, or demand side management programs. We encouraged customers to use less natural gas and be more efficient in their use of natural gas. We offer appliance rebates, weatherization rebates, business rebates, builder rebates, and home energy audits. We offered to options: in home or do it yourself mailings for the audits. Thermwise progress: fairly good customer acceptance, efficient application time, and more being installed now. The EnergyStar homes are 274% of what we projected. The program is working well. This is the pilot program: first of three years. It is going to take sustained effort to really make markets efficient, but we are making good effort. Even customers who don't participate will save money. Conservation enabling tariffs and demand side management costs go into rates, but total savings to systems in reduced purchase gas costs from just 1% is over a $100. If customers reduced by 10-15% a lot more savings. If you conserve you can save. The Governor's goal of 20% increase in energy efficiency can save the state upwards of 6 billion dollars.

**Doug Hunter, General Manager Utah Associate Municipal Power Systems**

- We make up 25% of the electric usage besides Pacificorp. Transmission is the number one crisis of utility business. The path to get a lot of this done is increased transmission. I do not think that mega transmission projects work. They never get fully built. A lot of time and money is spent for only a few pieces built. Last big transmission line constructed was in 1993. What we need is more mini transmission projects. Customers want energy reliability. In a smaller line, if one line goes out it is a minor problem. In a mega transmission line, if you lose it, then it is a major devastation. We formed a joint

project between Pacificorp and UAMPS, putting a combined about of $60 million dollars to meet growth. Policy makers should be aware of the growth, to get things done that need to get done.

- Renewable energy is only part of the answer to the increased demand. Our current growth rate is so high that we cannot meet demand on renewables alone. We can increase the renewable capability and make it a bigger part of our energy portfolio. A standard of over 20% in renewables is very hard to do. Also, the renewable resources need consistency, which means they need a reliable combustion-oriented energy to back it up. Coal can be hard to get, but the new super critical boilers are more efficient and burn less coal to get same kilowatt out. There is now a new ultra super critical coal plant being built in Europe.
- We need the most efficient usage of our energy. Minnesota tried to get a pulverized power plant built, but there was too much opposition who wanted IGCC instead. They withdrew the proposition and put in an IGCC proposition instead and the same people again opposed that opposition. We believe that post-combustion carbon capture is a better answer then IGCC. We need to work on it, but it is in initial stages now. There is selective catalytic reduction. We need the best available control technology, right now nothing has been proven to work for 500 or more megawatt output. Oxyfire is a new combustion on pulverized coal that would push coal prices $.5 to $.7. This is the same price as our alternatives: wind, solar, geothermal.
- Our regulation: 52 city councils that vary greatly. Some are very environmentally oriented with renewable portfolio standards and others are exclusively with coal. It is very piecemeal regulation. The California standard is not going to work for UT. California owns a lot of generation in UT. However, in Utah we have 3% of efficiency drops per 1000 feet elevation gain and more gas will have to be burned to get same kilowatts. We need to be more efficient. Fed government been vacant and the states have been picking up ball on this. Massachusetts vs. EPA said there needs to be regulations but it will be a year or more before we know. If the Courts decide it will be a piecemeal of Federal standard for everyone. States will be pre-empted.
- Sequestrations: we don't know a lot about this. EPA is currently asking for comments on this—the affects on ground and water, etc. EPA is trailing way behind. All utilities need to get involved as we are participating in the big studies. But we still need to make it specific to each site/area.

**Kimball Rasmussen, CEO Deseret Power**

- The Cooperatives were formed about 25 years ago. Federal policy leaned heavily in Oil Shale development and was pushing to make it happen. Then embargo ended, gas prices went down, and the MX missile was avoided. So deregulation happen and caused Enron from that in addition to causing an energy crisis, putting power prices in thousands, and forcing us to buy power and hurt financially. Governor Leavitt asked a group in 2000 what are we going to do? We said build a large single base load plant.
- UAMPS is working on IPP3, but we simply do not have the power in place to meet the need. We can talk about carbon sequestration, carbon capture initiatives, and transmission, and they are all critical, but we do not have the plant to meet the need.

We don't know the plan to solve all this, nor have the national backing to build new electrical resources. The energy from coal in our state is 85% to 90%, but in the rest of the country it is only 50% dependent on coal.

- We are stabilizing in our operating, but there are a lot of the environmental issues in Utah. We are in the top 5 in the country in cleanest generation and we lead the country in reliability. We are doing all we can to run our business of about 40% of the irrigation load in Utah. A 10% carbon tax would double our rate for a schedule A rate, 20% would triple those. How many of those irrigators would stay in business and where would the tax go? Just into the government or into RD&D? Is that a good idea? We need to talk about what is going to happen in our future.
- I am a big believer in conservation, weatherization, and efficiency. Our company has also engaged in renewable energy credits. We support that. We need to go about all of these issues in a rational way. A 25% renewable standard by 2025 initiative would be difficult to achieve. Do the math, if I grow 1.6% in a year, the amount of that growth is a very modest 100% from renewables. You can't grow unless it is renewables. One of our sister G&T have found that no diversity between the wind in those 13 states. They don't have system wide enough diversity to count on that wind, and gave to have peaking gas to supplement wind. 17300 windmills of the old windmills to equal the power output of bonanza plant. 100000 of those wind mills for matching Pacificorp. Can we build all those to meet the growth? We want to be environmentally responsible and a national G&T to build windmills in places where it makes sense. We can't force feed wind though and it is hard to find a place where there is good transmission and also has good wind.
- The reason of oil shale is to avoid another World Trade Center disaster and it is also one of the most energy intensive resources out there. However, there is a lot of concern because we are running a company now that was almost destroyed by the pushing and leaning back in the 1980s for oil shale. We spent hundreds and hundreds of dollars. We need to look at oil shale and make sure it makes sense. Transmission is huge problem. We try to build a transmission line and it can't get it permitted. Huge issues. I would like an honest conversation and try get on the same page. We all want to do things responsibly and for the environment. But we need to do something soon though or we will have a loss of industry and millions of dollars if we don't.

**Q&A**

- Have you looked at the new wind turbines?
    - Yes they have better technology to be more reliable. If we can find the wind where it would make sense, let's build the best project we can.
    - Sarah: There are new technology and have anemometers and know there are resources out there.
        - Kimball: What happens when you design a wind turbine for 30 mph wind, and it decreases: you get 1/8 of the power. The problem is that you cannot get a capacity factor out of the wind turbine, you can only get energy. Lets capture that in places in that are not offensive to people. But have to be smart about where those go. There is a limit to how many of those we can have.
- How much an energy resource is solar, do you think?

    - Kimball: I like solar, especially in the southern areas. Some incentives, but I looked into solar on my property I was building. The cost after the rebates was quadruple the energy value. I would like to see solar to continue to be investigated. It is the single most expensive renewable resource out there. On the practical side, it is not the answer today, but I would love to see it worked on.
- You mentioned that your rates would double on a carbon tax?
    - We way over built when the MX missile and oil shale push were there. Our members are small a percent of it and so it would double.
    - It would actually double based on tons? Yes sir, I believe it would. I am saying that is where we are, not saying it is true across the industry. For our circumstance it would be devastating.

**Laura Nelson**

- One thing that is clear: there is no single solution because there is no single cause either. It is a compilation of the variety of opportunities available to use that allows us to deliver quality of life.
- This forum is run by sponsors, which provide us with a room to meet in and a breakfast. For our next meeting, I would like to talk about the technology options to meet demand and where we move in the future. Perhaps a perspective from the colleges would help. We have several great research teams: the Biofuels team, the Heavy Oil Center, the Utah Clean Coal Center. I would like to look at nuclear as well. It was on the legislative bill to study. But we can't do nuclear without understanding the opportunities and without knowing how we will transport or store it. Utah will not be a dumping ground for nuclear waste. Nuclear energy is particularly important to have in the West. We need to think in collaboration, and of cost allocation, and innovations.